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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/699,080	10/26/2000	Philip J. Kuekes	10981967-1	5511

7590 01/14/2002

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Intellectual Property Administration  
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EXAMINER

WILLE, DOUGLAS A

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 01/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/699,080

Applicant(s)

KUEKES ET AL.

Examiner

Douglas A Wille

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 16-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 16 - 30 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.
3. Claim 16 refers to two crossed wires with one having a functional group attached to form a junction but there is no description of how the wires are formed, how the coating is performed or how the wires are brought and held in proximity. While it is suggested that in the specification that a paper by Guo shows a method of making a quantum wire this is not enabling for the whole device and raises the question of the effect of the substrate of the claimed operation. One of the functional groups mention in the specification is ammonia. How is this material placed and maintained in contact with the wires? This is a problem since it is not a solid. How close must the wires be and what is the tolerance? Do the wires have to be within a separation that is on the order of a molecular diameter? How would this be accomplished? What are the design principles that would apply to creating a real device? Will the functional groups react with the semiconductor or metal quantum wires and if so what happens to the integrity of the quantum wire structure? No example of a real structure with real materials is given and it is left up to the reader to invent a representative structure.

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To provide such a structure would involve considerable design and experimental effort and as such the disclosure is not enabling.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 20 and 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. Claim 20 states that a base region is induced in one wire. Where is the connection to the base region? Note that if one wire induces a npn in the other that the reciprocal effect is a pnp which form the possible connection.
7. Claim 24 refers to forming a first portion that is electrically insulating which extends from the metal wire. This is not understood. How is the electrical insulation formed and how does it extend from the wire? A second portion is not understood. Where is this second portion? The claim states that a gate region is induced. Does this mean that a channel region is induced? Correction is required.

*Claim Rejections - 35 USC § 102*

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
9. Claims 16 - 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Meyer et al.

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10. Meyer et al. show a quantum effect device (see cover Figure, Figure 3a, Figure 4 and column 3, line 50 et seq.) with crossed quantum wires where one wire is a semiconductor and the other wire may be regarded as the metal gate 32 or a combination of the metal gate and a part of the semiconductor layers. Note that since the semiconductor layers transfer charge due to the band offset effects, they perform modulation doping and are effectively the functional group.
11. With respect to claim 28, the limitation is a functional limitation which does not carry weight in a claim drawn to a structure.
12. Claims 16 - 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Frazier et al.
13. Frazier et al. show (see cover Figure and column 7, line 20 et seq.) a device consisting of crossed quantum wires where one wire is specifically stated to be a semiconductor and the other wire is specified to be conducting, and which could be a semiconductor. See also paragraph 15 above.

#### *Conclusion*

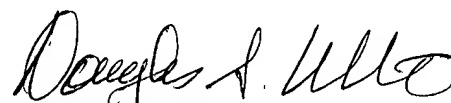
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (703) 308-4949.

The examiner can normally be reached on M-F (6:15-3:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Douglas A. Wille  
Patent Examiner

daw  
January 10, 2002